served so that they may show the habit of the plant, but also that they may be easily handled for examination. The time is long past when botanists are content with mere examination of the structure of the flower, the fruit, etc. The interior structure of the whole plant is far more important in these days. I do not think it necessary to recall the invaluable researches by Vesque, Radlkofer and several others, who have shown us the anatomical characters of plants. But in the manner in which the herbaria are preserved in our country, the specimens are not to be used for such a purpose. All the specimens in the U. S. National Herbarium in the Department of Agriculture are mounted on sheets in such a manner that the entire specimen has been glued and fastened to the paper. Hence the specimen can not be removed from the paper without being broken, and it is very clear that flowers with large petals and stamens can not be examined. For anatomical studies these specimens have lost the greatest part of their value; the covering of glands or hairs is disturbed by this method; and the stems and leaves can not be removed without being broken into pieces. And how about clusters of small flowers which we might want to examine? These are not at all to be removed. Might it not be time now to make a change in regard to the preservation of specimens? Unfortunately, as I have heard, this manner of preservation has been used in museums where the greatest collections are deposited. The new or rather very old and well-known method, which is to be recommended, is to mount the specimens with glued paper strips, which can easily be taken off so that the plant can be examined freely in the hand, and parts cut off which are wanted for examination. This is the general manner of preservation in Europe, and has been used with great success.

Washington, D, C. THEO. HOLM.

CURRENT LITERATURE.

Minor Notices.

IN *Annals of Botany* (vol. iv. no. 15. Aug. 1890) Dr. F. W. Oliver has given an excellent anatomical study of Sarcodes sanguinea, accompanied by four double plates illustrating anatomical details, and a fifth very large one showing the whole plant with its coloration. Of course any member of the Monotropeæ is worthy of careful study, both on account of habit of growth and affinities. Naturally, interest somewhat centers about the root structures, for the plant proves to be a saprophyte or humus-plant. The roots are everywhere invested in a close-fitting sheath of "fungal-mycelium," well displaying, as in Monotropa, the mycorhiza habit. Probably the most striking statement with regard to root structure is that all lateral roots have an exogenous origin! This habit seems to be in common with Pterospora, and the author considers it a special adaptation (a perpetuated advantageous variation) by which the formation of a wound in the cortex may be avoided, thus making the inner tissues less liable to the entry of the mycorhiza fungus (although Monotropa, with the same mycorhiza habit, has the usual endogenous branching). The stem, leaves, and morphology of the flowers are also considered. The development of the reproductive structures of the embryo sac is similar to that which has been fully described by Strasburger and Koch in the case of Monotropa.

PROFESSOR LESTER F. WARD has an interesting paper on the origin of plane-trees (reprint from *Amer. Nat.* Sept. 1890), being chiefly a discussion, from an American stand-point, of Johann Jankó's recent paper ("Abstammung der Platanen") in Engler's *Botanische Jahrbücher*. Professor Ward considers the genus Platanus the last of a long line of ancestry that was once far more abundant than at present, as is also true of Liquidambar, Liriodendron, Sequoia, and Ginkgo. One of the distinctive links in the chain of evidence in tracing the ancestry of Platanus proves to be the basal lobes of the leaf. The author revises the geological distribution of the fossil species of Platanus as given by Professor Jankó.

THE Proceedings of the National Museum, vol. xiii, contains a list of plants collected in 1889 at Socorro and Clarion Islands of the Pacific by the ornithologist (Mr. Chas. H. Townsend) of the Albatross expedition The islands are southwest from Lower California, and should be of great botanical interest. Mr. Townsend should be commended for securing this botanical material in addition to his regular duties. The flora, as is to be expected, is similar to that of Mexico. The plants were determined by Dr. Geo. Vasey and J. N. Rose, of the Department of Agriculture, the total number of species being 26, 18 of them being found on Socorro and 12 on Clarion, among them 3 new species and a variety.

THE THIRD Contribution from the U. S. National Herbarium (dated Nov. 1, 1890,) contains the results of a study of collections of plants made by Dr. Edward Palmer in 1890 in Lower California and western Mexico, at La Paz, San Pedro Martin Island, Raza Island, Santa Rosalia and Santa Agueda, and Guaymas. The work has been chiefly done by Mr. J. N. Rose, under the direction of Dr. George Vasey. New species are numerous, as is to be expected from such unexplored regions and such a collector. Among the new things from La Paz is a very curious genus of Compositæ, dedicated to John M. Coulter, and called Coulterella. The plate shows it to be a shrubby plant, with usually a solitary flower in the heads, whose achene is permanently enclosed by a 3-winged spongy involucre. About 25 new species are described, including a new Euphorbia by Dr. Millspaugh.

THE FIRST MEMOIR of the second volume of the Torrey Club Memoirs is by Dr. B. D. Halsted, on "reserve food-materials in buds and surrounding parts." There are two plates, and the author states his purpose to be "to consider the structure and reserve food-contents of the buds and surrounding parts in some of our trees and shrubs, with occasional reference to nourishing substances as stored in other parts of perennial plants." Particular attention is paid to starch; and it is suggested that spines, in addition to being defensive structures, may also act as food reservoirs.

DR. GEORGE VASEY has just issued the first part of "Grasses of the Southwest," being plates and descriptions of the grasses of the desert region of W. Texas, New Mexico, Arizona, and S. California. It is issued

as Bulletin no. 12 of the U. S. Dept. of Agriculture, Division of Botany, and contains 50 most excellent plates. The drawings have been chiefly done by Mr. W. R. Scholl, who is surely to be highly commended for his work, and in the descriptions the author has been aided by Mr. F. V. Coville. A second part, containing an equal number of plates, is now in preparation. This is undoubtedly the most important work on American grasses that has been undertaken, and it is to be hoped that not only the grasses of the desert region will be so treated, but all North American grasses.

NOTES AND NEWS.

THE BOTANICAL GARDEN at Prague was ruined by the great flood of last September.

DR. J. W. MOLL has been called to the professorship of botany at the University of Groningen.

PINUS Montezumæ, of Mexico, is described and illustrated in *Gardeners' Chronicle* for Oct. 25.

PROFESSOR CONWAY MACMILLAN, of the University of Minnesota, has been appointed botanist of the Geological and Natural History Survey of that State.

DESCRIPTIONS of 55 new North American fungi are published by Messrs. Ellis & Everhart in the Proc. Phila. Acad. The reprint bears the date July 29, 1890.

BOKORNY finds by observations with his iron sulphate process that water travels at the rate of 1 meter per hour in the collenchyma of Rumex longifolius.

HANSGIRG has listed and classified the plants having irritable filaments and stigmas, together with those having periodically opening flowers.—See Bot. Cent., 43, 409.

A REVISED list of the Ustilagineæ of Scotland, prepared by Professor J. W. H. Trail, is given in the October *Scottish Naturalist*. It includes 38 species, distributed under 11 genera.

PROFESSOR JOHN M. HOLZINGER, formerly of the State Normal School of Minnesota, has been appointed one of the assistants in the botanical division of the Department of Agriculture.

MR. JOHN ROBINSON, of Salem, Mass., has sent a curious apple, found by W. Leonard. It is a combination Baldwin and Russet, the former forming the upper half, the latter the lower.

THE FOLLOWING North American plants have been recently illustrated in *Garden and Forest:* Arbutus Menziesii (Oct. 22), Hypericum densiflorum and H. prolificum (Oct. 29), Solidago speciosa (Nov. 19).

MRS. E. G. BRITTON has prepared an index to the *Bulletin of the Torrey Botanical Club*, volumes vii–xvi. The previous volumes were indexed separately. Such indexes are absolutely essential to working botanists.

MR. F. V. COVILLE, of the Department of Agriculture, has been appointed botanist of the biological survey of "Death's Valley," California, under direction of Dr. C. H. Merriam. He has already started for the field, and expects to be absent about six months.